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SANDIA CORPORATION
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INVENTORIED MAR 1 1965
DATE

April 14, 1964

RS 5412/321

RECEIVED
APR 30 197
CENTRAL TECH FILE

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[redacted]

Adjutant General
Headquarters, Defense Atomic Support Agency
Washington 25, D. C., 20301

PROGRAM 01040 ORG. 6427
75901 CATEGORY DATE

INVENTORIED FEB 6 1965
DATE

Attn: J. G. Lewis

Dear John:

Why is it taken for granted (or is it?) that deeply buried hardened structures should be in hard rock? When I was last at .../DASA only that possibility was mentioned in talk about possible new installations. It can be argued that alluvium would be better, and better still would be rock under alluvium. Harry Auld has since told me some of you discussed this idea on your European trip and that they are kicking it around at AFWL, so the idea though independent is not original. I have made some estimates of my own, the results of which are indicated in the enclosed graphs.

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To estimate ground motion under surface or near-surface bursts, I started with pressure-distance curves in granite and alluvium as in Figure 1. Figure 1 gives estimates for 400 mt surface bursts on granite and alluvium, assuming 10% energy coupling and a Brode effect of 4, attenuation with distance proceeding as in free-field conditions (i.e., the curves are free-field 10 mt curves). Since structures will be designed to a motion criterion--Harry Auld tells me 20-30 ft/sec is being talked about--these curves were converted by the Hugoniot information of SC-4903 and UCRL-6311 to velocity-distance curves as given in Figures 2 and 3.

INVENTORIED SEP 27 1965
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Figure 2 has on it two solid lines which are velocities under 40 mt surface bursts on rock and alluvium, and two dashed lines which are velocities under

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AUG 20 1964
3427-1

THIS DOCUMENT CONSISTS OF 6 PAGE(S)

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APR 15 1964
3563/83

1ST REVIEW DATE: 12/16/94 DETERMINATION: CLASSIFICATION CANCELLED
AUTHORITY: ADC
NAME: R. B. Craner
2ND REVIEW DATE: 2/8/95
AUTHORITY: ADD
NAME: J. P. Trodden

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